A critical appraisal of "Conservative Treatment of Thoracic Outlet Syndrome: a 2-Year Follow-Up"

By

Joey DiMercurio, SPT

In partial fulfillment of the

requirements for the course:

PT 7240 Evidence-Based Practice in Physical Therapy

Department of Physical Therapy

Angelo State University

Member, Texas Tech University System

November, 2017

Abstract

The article "Conservative Treatment of Thoracic Outlet Syndrome: a 2-Year Follow-Up" by Karl August-Lindgren, MD, PhD is a descriptive study published in 1997 in the Archives of Physical Medicine and Rehabilitation measuring general long-term effects of therapy on patients with positive Thoracic Outlet Syndrome. From 1988-1993 a rehabilitation clinic saw 119 positive cases of TOS and therapy was implemented to combat symptoms. Patients received an average of 11.4 days of treatment for their TOS and their progress was tracked over a period of two years. A number of therapy techniques is described in words and figures to provide the reader with what the conservative treatment entailed. The efficacy was measured by their return to work, cervical spine motion improvement, and personal satisfaction with the treatment. Due to the nature of the study, the timeline varied between subjects and outcomes. The long term study found statistical significance in personal satisfaction and the treatment for patients returning to work. The authors note that the likelihood of returning to work is more likely for sedentary occupations as opposed to manual labor occupations.

In both the introduction and discussion, conservative treatment for TOS is contrasted with surgery as a solution to alleviating the symptoms arising from the condition. The author is skeptical of the efficacy of surgery and suggests conservative treatment is oftentimes a superior method in combating TOS. Furthermore, the medical field's general view is described for Thoracic Outlet Syndrome by noting many physicians' skepticism of the mere existence of the condition and varying causes of manifestation. Overall, Dr. Lingren attempts to put conservative treatment for TOS in context for the broad field of medicine.

Key words

Thoracic Outlet Syndrome, Physical Therapy, Conservative Treatment, Neurogenic

Introduction

Thoracic Outlet Syndrome is a condition in which neural and/or blood vessels are compressed when passing from the neck to the armpit region. Physical therapy is often utilized for treatment of symptoms associated with the neurogenic type of Thoracic Outlet Syndrome and is the type that is described in this article. The view of Thoracic Outlet Syndrome in modern medicine varies widely as many physicians are doubtful of its reported prevalence or its total existence.

This article is a thorough and long-term examination of the effects of conservative treatment for combating the symptoms of TOS. Symptoms typically include pain, weakness, and numbness in the upper extremity. The article that will be critically appraised in this paper may be over 20 years old at the time of this writing; however, much of it is still prevalent to modern practice of physical therapy. The article will be examined in its entirety for its quality, prevalence, and potential implications for modern physical therapy practice. It will be evaluated in how it answers the question, "In middle-aged adults with neurogenic Thoracic Outlet Syndrome, are therapeutic exercises effective in reducing pain, numbness, and weakness?"

Methods

To answer my research question of the efficacy of therapeutic exercises in reducing pain, numbness, and weakness for those affected by Thoracic Outlet Syndrome, I used two data bases primarily. The first one was Google Scholar and the second was PubMed. While Google Scholar provided a large number of potential articles, I knew that PubMed had stricter criteria for quality and content of articles so I primarily utilized that search engine to find adequate studies.

Furthermore, I was looking for articles with pdfs readily available without having to purchase a subscription to a journal or going through the process of waiting for full text through a library system. I also wanted articles that studied general adult populations instead of other age groups or more specific subgroups of adults. After sifting through dozens of articles about thoracic outlet syndrome and trying out different search terms, I came across several articles that fit my criteria and answered my research question. Some of the search terms I used included: Thoracic Outlet Syndrome, neurogenic, treatment, exercises, range of motion, adults experiment, and study. The most applicable article I found is the article that will be appraised in this paper.

The article "Conservative Treatment of Thoracic Outlet Syndrome: a 2-Year Follow-Up" by by Karl August-Lindgren, MD, PhD is a 1997 study published by the Archives of Physical Medicine and Rehabilitation from the Department of Rehabilitation at Kuopio University Hospital in Finland. Amongst the hundreds of hits from various searches, this article seemed to be the most applicable for my research question as it examines the efficacy of therapy for the treatment of TOS for a long timeline and by practical measures.

Results

Summary of the study

This study was unique as it wasn't a traditional double-blind study isolating variables and instead by its long-term and practical nature of being a descriptive study it had a lot of differences between subjects and observed general changes. For example, 119 subjects ranged in impatient time from 4 to 24 days with an average of 11.4 days and the follow-up ranged from 0 to 60 months with an average of 24.6 months. The timeline included therapists teaching subjects

at-home exercises during their inpatient time and measuring outcomes like personal satisfaction and return to work for the long-term follow-up. The results from the study indicated statistical significance for the efficacy of conservative treatment for both personal satisfaction and return to work and interestingly noted that return to work was more favorable for sedentary occupations than heavy labor. The discussion of the study concludes that conservative treatment for Thoracic Outlet Syndrome works for most cases and that teaching at-home techniques with follow-up is advisable.

Appraisal of the study introduction

Although relatively short, I believe the introduction explains Thoracic Outlet Syndrome well and puts the condition into context in its current standing within the medical field. It states common causes that result in the manifestation of pain, weakness, and numbness in the upper extremity such as compressing ribs, congenital abnormalities, connective tissue, trauma, and potential abnormal growths. Furthermore, the introduction describes the purpose of the study by describing the oftentimes unproductive surgical measures that are used to alleviate symptoms. Several studies are cited revealing the author's skepticism of invasive surgery on the treatment of TOS. The introduction adequately provides context for the purpose of studying conservative treatment for the condition in a field where several options are available.

Although generally strong and concise, the introduction could have expanded to talk about the different types of conservative treatment a therapist might utilize for treating TOS. For example, the introduction could have mentioned how both stretches and exercises can be used and how different interventions could improve symptoms from different causes.

Appraisal of the study methods

The article goes into great lengths in describing the methods of the experiment and its detail of conservative treatment is one of the strongest aspects of the article. There are several pictures with descriptions describing the various exercises taught to subjects. For example, a cervical spine exercise with the patient against the wall is described in detail providing the reader with specific details in what type of therapy is being implemented in treatment. Several tables are provided showing the various differences in patient populations and tests for positive TOS.

One of the weaknesses in the methods is describing the follow-up measures for the subjects. Due to a large number of variability between subjects, it was difficult for the author to explain in text how each subject was measured. Ideally, in a stud like this, the number of variables would be minimized. However, due tot the nature of the descriptive study, only general outcomes could be measured. Subjects weren't even on the same timeline as inpatient time and follow-up time ranged drastically. This is one of the primary weaknesses of the article as there wasn't a lot of control for all of the subjects. However, this would be near impossible given the timeline and practicality of the study.

Appraisal of the study results

The results section is written in a clear manner and does a decent job explaining the variations of the study; for example, it discusses how some patients ended up having a diagnosis other than TOS. The results support the articles hypothesis for conservative treatment's efficacy for return to work and personal satisfaction showed statistical significance. Furthermore, the tables are concise and describe in greater detail the results across subjects.

One of the weaknesses of the results is that the tables – although concise – have many asterisks with exceptions for the subjects. The article also failed to mention MCID and NNT. These numbers would be applicable to other medical professionals in clinical settings trying to decide what types of treatment to utilize for TOS.

Appraisal of the study discussion

The discussion does an excellent job in putting the efficacy of conservative treatment into broad context in the medical field. Although the article is 20 years old, it provides its context in the literature at the time for TOS. For example, it mentions the decline of surgical intervention for TOS and the rising use of conservative treatment. At the same time, it references articles that are skeptical about the diagnosis and treatment of TOS in a therapy setting. As appropriate for a general descriptive study, it generalizes the use for conservative treatment as useful for most cases.

A weakness of the discussion is that the author seems to input small personal biases to counter every reference that goes against conservative treatment or advocates for surgery. It would have been ideal to have the results of the study speak for themselves and instead present the current literature without delving into the flaws of other articles more than necessary. Most articles have some strengths and flaws and just because a study may have one flaw doesn't mean the article should be considered useless.

Discussion

Physical therapists have to work with patients in both outpatient and inpatient contexts that are symptomatic of Thoracic Outlet Syndrome and although dated, this article describes the

efficacy of conservative treatment for most cases. In general, this article is very relevant to my original question as it describes that conservative treatment for TOS is effective in helping patients return to work and reducing symptoms through measuring personal satisfaction.

This article, although having its flaws in design, provides enough practical measures to support use of therapeutic exercise for the treatment of TOS. The advantage of using this type of treatment is that it is low-risk when compared to other intervention such as surgery. However, there is a possibility that conservative treatment won't help a patient and will leave them unsatisfied with time wasted. However, this is often the nature of physical therapy. In general, due to the low-risk nature of therapeutic exercise it is almost always worth it to at least try out conservative treatment before opting for more invasive interventions. More traditional double-blind studies could help support or dispute this type of treatment.

I believe there is enough evidence to implement this type of therapy for a client as it shows to have practical application and is low-risk. The statistical significance for patient satisfaction and return to work are significant and are already utilized in treatment for TOS. As a future physical therapist, the treatments described in the article are readily available as they are basic and can be performed in home.

Despite the lack of controlled variables due to the nature of the descriptive study, I feel that this article is thorough enough to justify conservative treatment for patients with TOS. However, I would like to see additional double-blind studies that support this articles conclusion.

This article, although dated, provides a lot of information advocating for conservative treatment for treatment of TOS. I will personally recall this article for future patients with TOS as it shows long-term effectiveness in practical measures.